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ROSEN AVIATION

19" High-definition Widescreen Display

Technical Manual

Model 1900 Series

Document Number 104328 Rev C

Technical Manual, 19” High-definition Widescreen Display

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Contents

1. INTRODUCTION 5
1.1. Unpacking 5
1.2. Additional System Materials 5
1.2.1. Connector Kits 5
2. VIDEO INPUTS 5
3. INSTALLATION GUIDELINES 6
3.1. Cooling and Ventilation 6
3.2. Mounting Options 6
3.3. Infrared Receiver and Status LED 8
3.4. Electrical Requirements 8
4. VIDEO CONNECTIONS 8
4.1. Pinout Connections 8
5. RS-232 AND RS-485 CONTROL INPUTS 9
6. IR REMOTE CONTROL 10
7. OSD MENU OPTIONS 11
7.1. Exit 11
7.2. User Menu 12
7.2.1. Backlight 12
7.2.2. Aspect Ratio 12
7.2.3. Scheme 13
7.2.4. Source 13
7.2.5. Auto Adjust 14
7.3. Image Adjust 14
7.3.1. Scheme 14
7.3.2. Brightness 14
7.3.3. Contrast 15
7.3.4. Saturation 15
7.3.5. Hue 15
7.3.6. Sharpness 16
7.3.7. Reset Scheme 16
7.3.8. Image Adjust Advanced (Submenu) 16
7.4. Info 20
8. TECHNICIAN MENU 21
8.1. Advanced Technician Menu 22
8.1.1. Factory Reset 22
8.1.2. Viewing Angle 22
8.1.3. Comp/RGB 1 23
8.1.4. Comp/RGB 2 23
8.1.5. 3D Comb Filter 23
8.1.6. Composite SIG (Signal) 23
8.1.7. AGC (Automatic Gain Control) 23

8.2. Power Mode 24
8.3. OSD Timeout 24
8.4. Network ID 25
8.5. Splash Screen 25
8.6. Front Panel LED 25
8.7. Source Mode 25
8.7.1. Momentary Switch Mode 26
8.7.2. Constant Switch Mode 27
9. TECHNICAL REFERENCES AND SUPPORT 27
9.1. Troubleshooting 28
9.2. Cleaning the Display 28
9.3. RTCA DO-160F Qualifications 29
9.4. Other Certification Considerations 31
9.5. Specifications 31
9.5.1. Supported DVI/HDMI Graphic Resolutions 31
9.5.2. Supported DVI/HDMI Standard Resolutions 32
9.5.3. Supported VGA Resolutions 32
9.5.4. Supported YPbPr/Component Resolutions 32
9.5.5. Supported CVBS/Composite Resolutions 32
9.5.6. Supported SDI Resolutions 33
10. DEFINITIONS 33
11. REVISION HISTORY 34

1. INTRODUCTION

This manual describes how to install the Rosen 19” High-definition Widescreen displays with integrated electronics onto your aircraft. It contains everything you need to know to wire the display and confirm that it is functioning correctly.

Note: Only trained and qualified personnel should perform installation and service.

1.1. Unpacking

The 19” displays ship with an RC5 remote control (P/N **0500-019**).

1.2. Additional System Materials

Drawings for the Rosen Model 1900 di**splays** are available on the Rosen website at www.rosenaviation.com.

From the Rosen Aviation home page, select the **Products→Displays→High Definition Displays** tab and browse by product size.

An optional universal color display remote control (sold separately) is compatible for use with the 1702 series displays. Please contact Rosen Sales for P/N availability.

1.2.1. Connector Kits

The following connector kits (sold separately) are recommended for optimal performance:

- Connector kit—26-pin female (P/N **0300-043**)
- Connector kit—25-pin female D-sub (P/N **0300-052**)
- CVBS and SDI connector kit—BNC (P/N **0300-051**)
- Component/RGB, digital HDMI/DVI connector kit—25-pin (P/N **0300-029**)

2. VIDEO INPUTS

The 1900 series displays enable viewers to watch high-definition video as well as standard-definition video. Available video inputs include the following:

- 2 HD-SDI inputs
- 2 composite (CVBS)
- 2 DVI inputs (HDMI)
- RGB & Component (YPbPr) - through the DVI connectors only
- Accepts inputs up to 1080p, VGA-WUXGA

Control inputs for these units are via an IR (infrared) remote interface, RS-232, or RS-485 external inputs. The display connects to 28VDC aircraft power and receives video through a video distribution amplifier or directly from video sources.

3. INSTALLATION GUIDELINES

3.1. Cooling and Ventilation

The 19” displays require free-air ventilation; do not block the top, bottom, or rear vent holes.
Options:

- 1-inch air gap and a minimum of 2.25 square inches vent area to the cabin above and below the display, or
- For bulkhead installations a minimum of 1700 cubic inches around the display.

For optimal performance, provide a .5-inch or greater gap between the back of the display and the bulkhead.

3.2. Mounting Options

You can mount a 19” display from any of the four sides by removing the #10-32 screws, or use a rear-surface mount using the threaded holes as mounting points.

- Side mount–left and right (six screws)
- Rear-surface mount (minimum of four screws)
- Top and bottom mount (eight screws)

When mounting the display from the top, bottom, or sides, use all mounting holes. For a back mount, use a minimum of four mounting holes. The following figures show the mounting option dimensions for this display.

For mounting, remove only the #10-32 screws; do not remove the smaller #4-40 flathead screws. Do not exceed a .375-inch insertion depth.

(Dimensions are in inches)

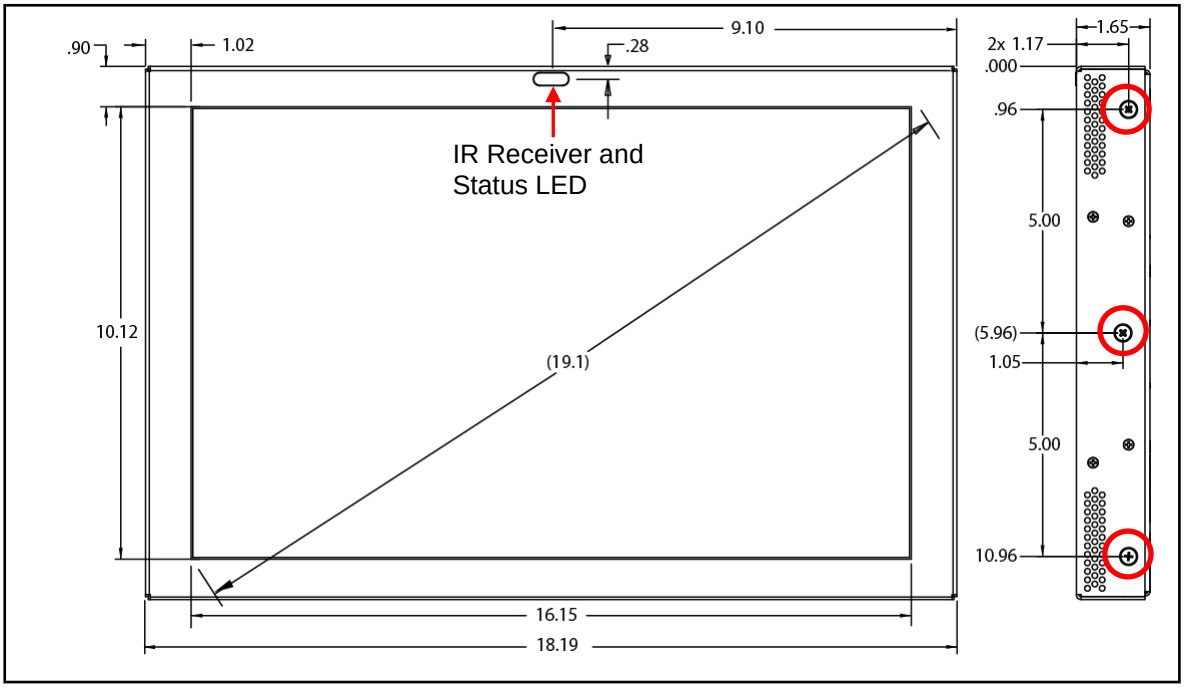


Figure 1 Dimensions for the side mounting holes

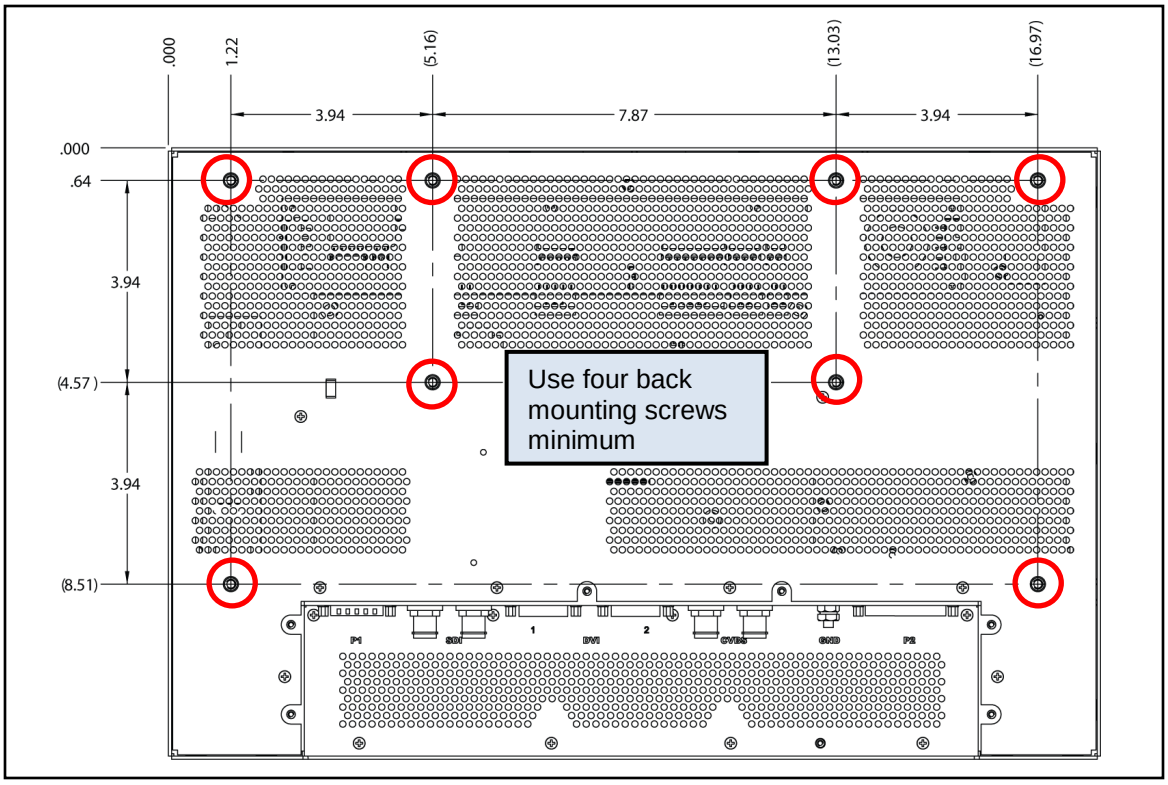


Figure 2 Dimensions for the rear surface mounting holes

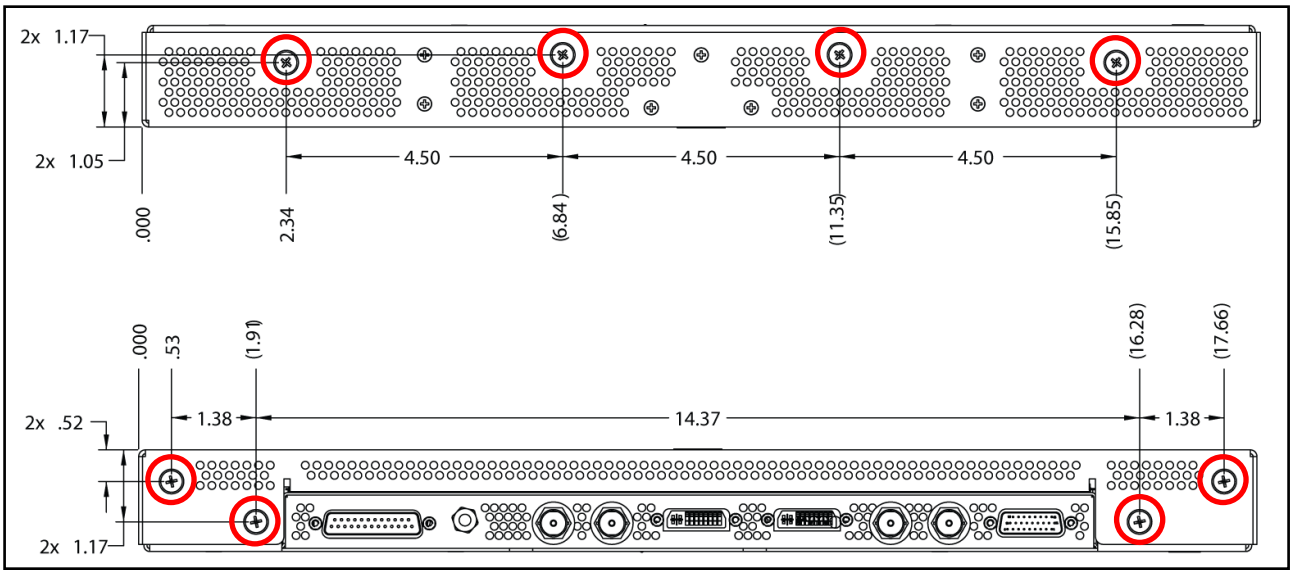


Figure 3 Dimensions for the top/bottom mounting holes

3.3. Infrared Receiver and Status LED

The display has an internal infrared (IR) remote receiver on the rear connector (pin #18) and a status LED on the front panel. See Section 8.6, Front Panel LED, on page 25 for information about the LED operation.

3.4. Electrical Requirements

- Nominal voltage: 28VDC. Display can operate from a voltage range of 18-32VDC.
- Max Power Consumption: 28 W
- A grounding post connected to chassis ground is accessible for a ground connection.

NOTICE Do not plug or unplug the display connector while power is applied.

4. VIDEO CONNECTIONS

The 1900 series displays use connectors P1—P2, as shown below.

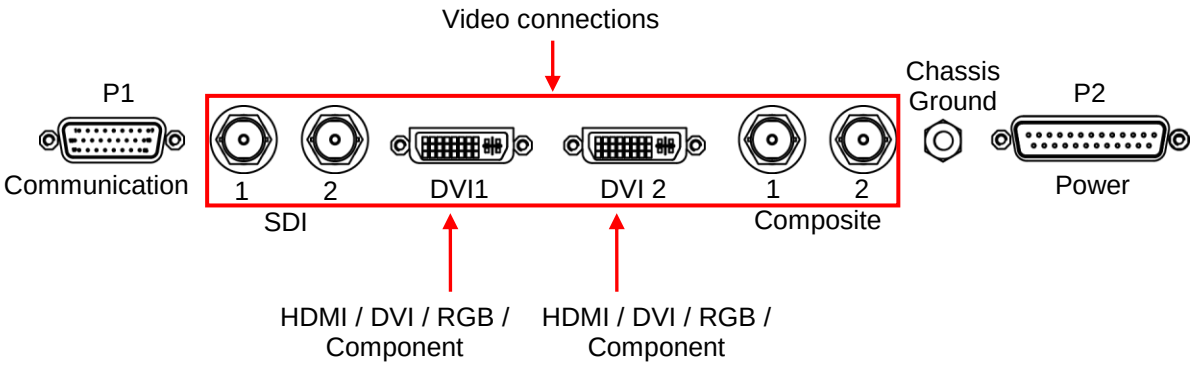


Figure 4 19" High-definition Widescreen display connections

4.1. Pinout Connections

There are several ways to connect the 19” display to an aircraft’s entertainment system.

Use the pinout descriptions on page 2 of the *Outline and Installation* drawings to assist in the wiring process. Pay close attention to the pinout information while completing wiring connections.

Note: This display is for entertainment purposes only; connect to a non-critical power bus.

5. RS-232 AND RS-485 CONTROL INPUTS

Inputs that control the display can come from an IR, RS-232-based 7-button external controller (P/N **0300-408**), or via a cabin management system using RS-232 or RS-485. The 1900 series displays accept the following commands:

Table 1 RS-232 and RS-485 commands

Control	RS-485 Commands
Power ON	Turn the display on
Power OFF	Turn the display off
Source Composite 1	Select composite 1 video input
Source Composite 2	Select composite 2 video input
Source HD-SDI 1	Select HD-SDI 1 video input
Source HD-SDI 2	Select HD-SDI 2 video input
Source RGB 1	Select analog RGB 1 video input
Source RGB 2	Select analog RGB 2 video input
Source HDMI 1	Select HDMI 1 video input
Source HDMI 2	Select HDMI 2 video input
Source Component 1	Select Component 1 video input
Source Component 2	Select Component 2 video input
Ping Address (RS-485 only)	Used by master device to detect all devices attached to the network
Exit	Exit the menu
OK/Enter	Selects active option when OSD is active
Control	**RS-232 7-button External Controller Command Set**
Power	Toggles the display on or off
Source	Scrolls through enabled video inputs
Menu/Select	Displays OSD. Selects active option when OSD is active
Left	Navigate left through the OSD menu
Right	Navigate right through the OSD menu
Up	Navigate up through the OSD menu
Down	Navigate down through the OSD menu

6. IR REMOTE CONTROL

The 1900 displays use a remote control for basic operations and to adjust the on-screen display (OSD) settings. The following table shows the RC5 IR remote button layout and the button descriptions.

Table 2 RC5 IR remote control

Note: The AUTO button works only when an RGB source is active. The MUTE and VOLUME ± buttons are not used.

How it Works
SOURCE Switches between any enabled video inputs. Press the **SOURCE** button twice to switch inputs. The first command sent will only display the current source name in the upper-left corner of the monitor; the second command switches the source.
POWER Turns the power on and off. The LED indicator on the IR window is black when the power is off and green when power is on. The LED can be turned off so that it will not illuminate.
MENU Opens the Main Menu to access other settings and fine-tune the display’s picture quality. For details, see Section 7, OSD Menu Options, on page 11.
EXIT Closes the OSD and saves settings. Exit does not close control bars.
ENTER Accepts changes to menu settings. Selects menu options, accepts settings, and closes the control bars.
◄►▲▼ Controls the navigation in the on-screen display menus. Navigate between the OSD menu pages, options, and change settings.
ASPECT Changes the aspect ratio or proportions of the picture depending on the video format. Switches between Full Screen, Pillar Box, and Letterbox Expanded. See also Section 7.2.2, Aspect Ratio, on page 12.
INFO Opens the Info page on the OSD. Use INFO to verify source and resolution values. Also quick access to open the Technician Menu.
AUTO (**RGB only**) Performs an auto-adjust function without a menu. Forces the display to evaluate the RGB signals and ensure it is interpreting them correctly. See also Section 7.2.5, Auto Adjust, on page 14.
BRIGHT ± Opens the backlight control bar. See also Section 7.2.1, Backlight, on page 12.

7. OSD MENU OPTIONS

The OSD contains screen settings, menu options, and informational readouts that display over the image, as shown below. Press **MENU** on the remote to open the Main Menu, as shown in Section 7.1. Press the ▲▼ buttons to navigate within the menu pages. Press the ►◄ buttons to navigate between the menu page, options, and values columns. The yellow highlighted area shows the currently selected option in the menu.

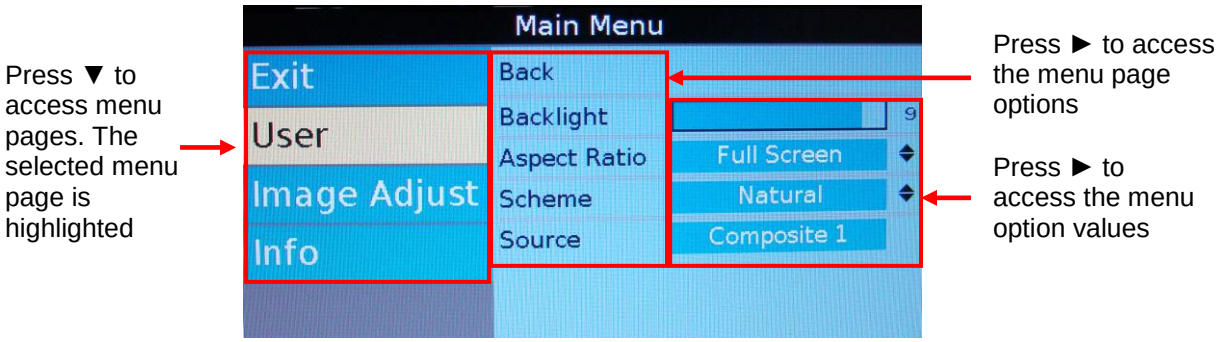


Figure 5 OSD menu options

The available menu options will vary depending on which source signal is active.

- Press **ENTER** or **MENU** to choose a setting or an option.
- Select the **Back** option to switch menu pages.
- Press **EXIT** to close the OSD and save settings.

Note: The on-screen display will timeout and close automatically after no screen activity for a preset amount of time, which is adjustable on the Technician Menu→OSD Timeout option. See Section 8.3, OSD Timeout, on page 24.

7.1. Exit

Use Exit to close the OSD. When you press **MENU** on the remote, the OSD opens to this screen, as shown below. Press **MENU** again to close the OSD from this screen.

Press the ▲▼ buttons to access the other menu pages in the OSD.

From other settings within the OSD, press **EXIT** on the remote control.

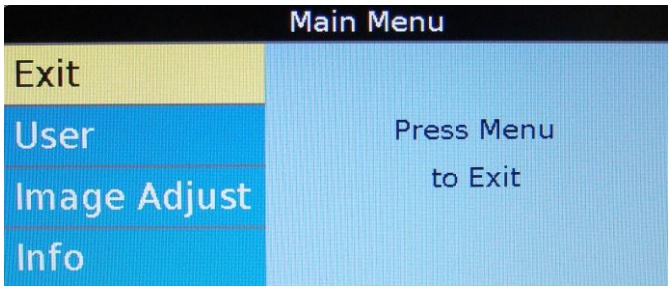


Figure 6 Opening screen for the Main Menu

7.2. User Menu

The User Menu contains frequently used control settings. Press **MENU** on the remote to open the Main Menu, and press the ▼ button to access the User menu options.

Press the ► and ▼ buttons to select a User option and press **ENTER** to change an option’s value.

Figure 7 User menu options

7.2.1. Backlight

Use this setting to adjust the intensity of the LCD backlight.

From the User page, press the ► and ▼buttons to select Backlight and then press **ENTER** to open the control bar shown below.

Press the ◄ or the ► buttons to change the value on the control bar accordingly.

Press **ENTER** to set the backlight brightness and exit the setting.

Figure 8 Backlight option

7.2.2. Aspect Ratio

Use Aspect Ratio to adjust the picture expansion to match the encoding of the source image most closely. Select **User→Aspect Ratio** and then press **ENTER**. To switch the display between aspect ratio modes (described below), press the ▲ ▼ buttons. Watch for proportional changes in the background picture and choose the optimal mode for the source. Press **ENTER** to set the mode and press **EXIT** to close the OSD.

To change the Aspect Ratio from the remote, press **ASPECT**.

Full Screen: Displays standard 4:3 source video in 16:9 aspect ratio by expanding the image horizontally. Circles will appear as ovals in the central and outer portions of the screen. If the source image is letterboxed, there will be black bars at the top and bottom of the image. A 16:9 widescreen source will fill the screen with minimal distortion.

Pillar Box: A standard 4:3 source image will appear with vertical black bars on the left and right side of the image. If the image source is letterboxed, then there will also be horizontal bars at the top and bottom of the image as well.

Letterbox Expanded: Expands the source video in the vertical and horizontal dimensions to fill the display screen. Letterbox-format DVDs will have small or no bars showing in this mode, while 4:3 aspect video sources will be expanded beyond the screen boundaries, appearing cropped.

Note: The Letterbox Expanded mode is not available for RGB or a graphic, PC-based HDMI/DVI source.

7.2.3. Scheme

There are two default color settings or schemes: Natural and Vivid. If the screen colors are not what you expect, select Scheme and press the ▲▼ buttons to toggle between the settings. The background picture’s colors change as you toggle between the settings. Vivid uses a higher color saturation level above the Natural level.

Try both schemes to determine which one you like best before adjusting the other picture quality settings.

Select **User→Scheme** and then press **ENTER** to access the settings.

Select the setting and press **ENTER** to remain in the OSD, or press **EXIT** to accept the changes and close the OSD.

7.2.4. Source

The Source page displays a list of all available sources and indicates which source is current.

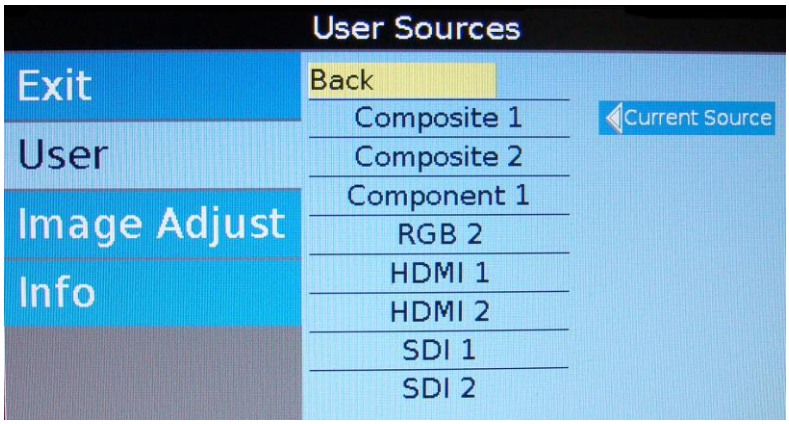


Figure 9 User Sources

Select **User→Source** and press **ENTER** to access the settings.

To switch the current source, press the ▲ and ▼ buttons.

Press **ENTER** to accept any changes, and press ◄ to remain in the OSD or **EXIT** to close the OSD.

To switch sources directly from the remote control, close the OSD and press the **SOURCE** button twice for each input.

7.2.5. Auto Adjust

(RGB only) Use Auto Adjust when the RGB source is active to force the display to evaluate the RGB signals and ensure that it is interpreting them correctly. To perform an Auto Adjust within the OSD, select the option and press **ENTER**. From the remote, press the **AUTO** button. The screen will go black briefly while the signals adjust.

7.3. Image Adjust

Use the Image Adjust menu pages, as shown below, to control the color and picture quality. Highlight Image Adjust and press the ► button to highlight the options, and then press **ENTER** to change the option values.

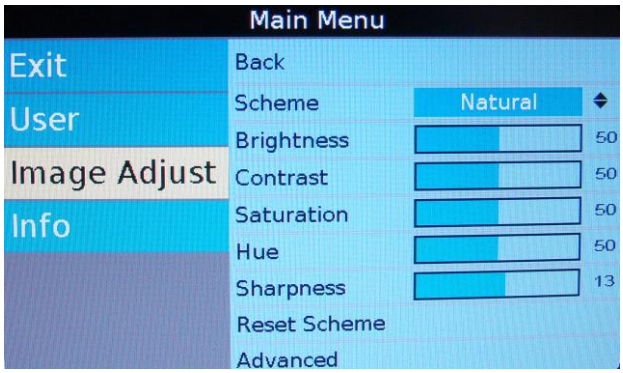


Figure 10 Image Adjust menu pages

7.3.1. Scheme

Scheme is also available from the Main Menu→User page. For information about how this option works, see Section 7.2.3 on page 13. Scheme affects changes you make on the User menu page settings, too.

7.3.2. Brightness

To adjust the picture brightness, press **MENU** and the ▼ arrow to select **Image Adjust→Brightness,** and then press **ENTER** to open the screen below.

Press the ◄ or the ► buttons to change the brightness on the LCD accordingly.

Press **ENTER** to set the brightness and close the control bar.

Press **EXIT** to close the OSD.

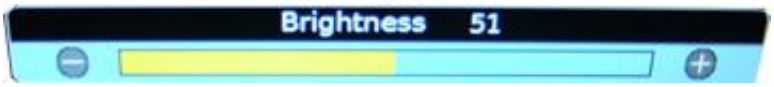


Figure 11 Image Brightness control bar

7.3.3. Contrast

To adjust the contrast, press **MENU** and the ▼ arrow to select **Image Adjust→Contrast**, and then press **ENTER** to open the screen below.

Press the ◄ or the ► button to raise or lower the contrast.

Press **ENTER** to set the contrast and close the control bar.

Press **EXIT** to close the OSD.

Figure 12 Contrast control bar

7.3.4. Saturation

To adjust the color saturation, press the **MENU** button and the ▼ arrow to select **Image Adjust→Saturation,** and then press **ENTER** to open the screen below.

Press the ◄ or the ► button to raise the color levels.

Press **ENTER** to set the saturation and close the control bar.

Press **EXIT** to close the OSD.

Figure 13 Saturation control bar

7.3.5. Hue

To adjust the color hues, press the **MENU** button and the ▼ arrow to select **Image Adjust→Hue**, and then press **ENTER** to open the screen below.

Press the ◄ or the ► button to raise the color hues in the image.

Press **ENTER** to set the hue and close the control bar.

Press **EXIT** to close the OSD.

Figure 14 Hue control bar

7.3.6. Sharpness

To adjust the picture sharpness, press the **MENU** button and the ▼ arrow to select **Image Adjust→Sharpness**, and then press **ENTER** to open the screen below.

Press the ◄ or the ► button to adjust the focus.

Press **ENTER** to set the sharpness and close the control bar.

Press **EXIT** to close the OSD.

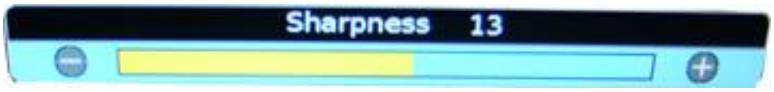


Figure 15 Sharpness control bar

7.3.7. Reset Scheme

Restores the values of the current scheme to their default settings, and it affects only the current source. Use Reset Scheme to revert to the default screen colors if the other Image Adjust options did not correct the screen quality changes that you expected.

Select Image Adjust→Reset Scheme and then press ENTER.

Press **EXIT** to close the OSD.

For information about the different scheme modes, see Section 7.2.3 on page 13.

7.3.8. Image Adjust Advanced (Submenu)

Use the Image Adjust→Advanced submenu options, as shown below, to fine tune the primary screen colors and to restore the monitor’s factory screen settings. Press the **MENU** button and the ▼ arrow to select **Image Adjust→Advanced**, and then press **ENTER** to open the menu.

To close the menu, select the **Back** option, or press **EXIT** to close the OSD.

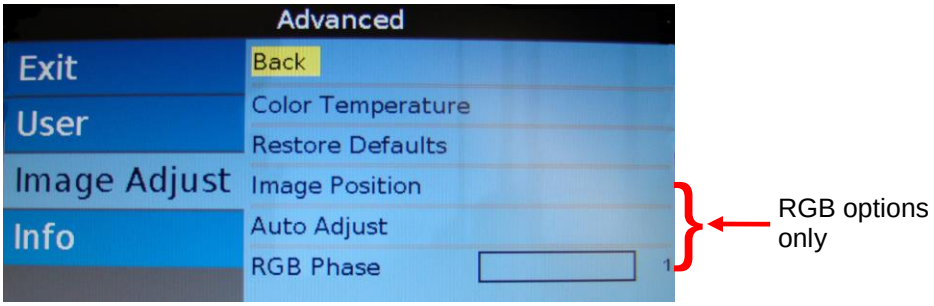


Figure 16 Advanced submenu options

7.3.8.1. Color Temperature

Use the Color Temperature options to change the white point of the picture in all sources. When you select Color Temperature, the screen changes, and a toggle appears to switch between User and 6500K, as shown below.

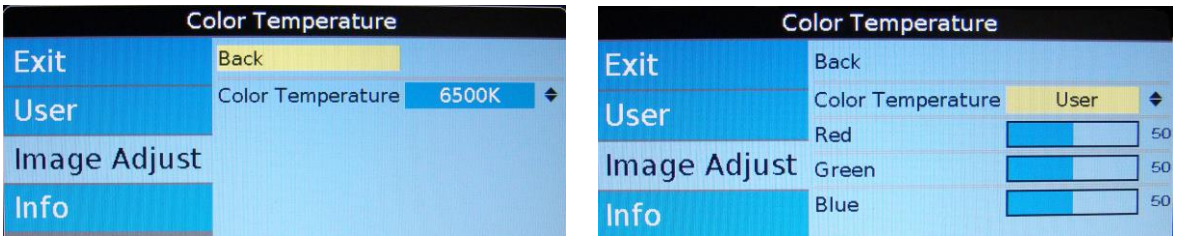


Figure 17 Color Temperature options

Select the **User** setting and then press **ENTER**.

Press ▼ to access the individual colors.

7.3.8.1.1. Red

Red adjusts the low-level registers of the red values in the picture. From the **Image Adjust→Advanced Menu**, press the ▼ button and **ENTER** to access Color Temperature.

Press ▼ to select **Red** and press **ENTER** to open the screen below.

Press the ◄ button several times; the image should show more cyan tones. Press the ► button several times to intensify the red tones.

Press **ENTER** to set the color and close the control bar.

Press **EXIT** to close the OSD.

Figure 18 Red control bar

7.3.8.1.2. Green

Green adjusts the low-level registers of the green values in the picture. From the **Image Adjust →Advanced Menu**, press the ▼ button and **ENTER** to access Color Temperature.

Press ▼ to select **Green** and press **ENTER** to open the screen below.

Press the ◄ button several times; the image should show more magenta tones.

Press the ► button several times to intensify the green tones.

Press **ENTER** to set the color and close the control bar.

Press **EXIT** to close the OSD.

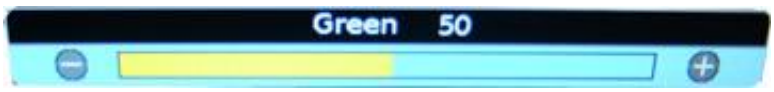


Figure 19 Green control bar

7.3.8.1.3. Blue

Blue adjusts the low-level registers of the blue values in the picture. From the **Image Adjust →Advanced Menu**, press the ▼ button and **ENTER** to access Color Temperature.

Press ▼ to select **Blue** and press **ENTER** to open the screen below.

Press the ◄ button several times; the image should show more yellow tones.

Press the ► button several times to intensify the blue tones.

Press **ENTER** to set the color and close the control bar.

Press **EXIT** to close the OSD.

Figure 20 Blue control bar

7.3.8.2. Restore Defaults

This option restores the default screen settings from the user menus for all video sources; it does not erase the Technician Menu settings. A Defaults Restored message appears in the lower corner of the menu after the restore is complete.

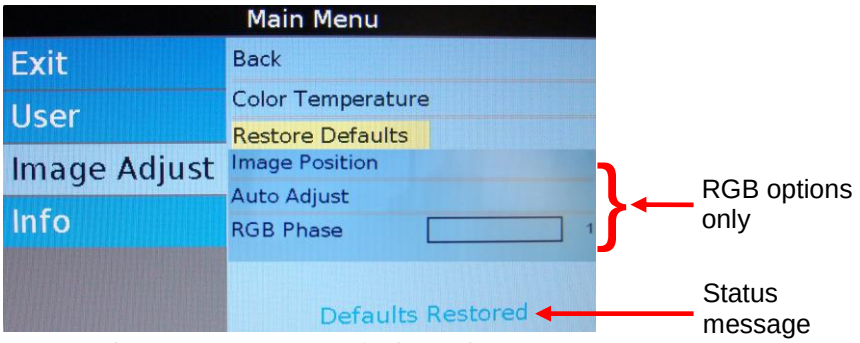


Figure 21 Restore Defaults option

7.3.8.3. Image Position Submenu

(RGB only.) Use the Image Position options to center an RGB picture horizontally or vertically on the screen. **Note:** Changing the resolution, source, or cycling power will reset any adjustments to this submenu’s settings.

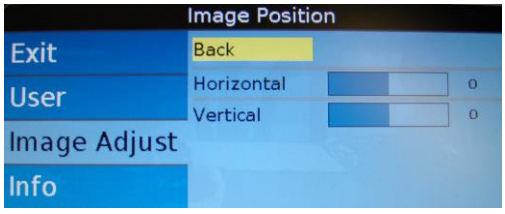


Figure 22 Image Position option

7.3.8.3.1. Horizontal

From the **Image Adjust→Image Position** menu, press the ▼ button to choose **Horizontal** and then press **ENTER** to open the screen, as shown below.

Press the ◄ button to shift the picture left or the ► button to shift it to the right.

Press **EXIT** to set the phase value and close the control bar.

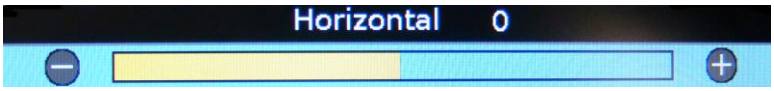


Figure 23 Image Position-Horizontal option

7.3.8.3.2. Vertical

From the **Image Adjust→Image Position** menu, press the ▼ button to choose **Vertical** and then press **ENTER** to open the screen, as shown below.

Press the ◄ button to shift the picture up or the ► button to shift it down.

Press **EXIT** to set the phase value and close the control bar.

Figure 24 Image Position-Vertical option

7.3.8.4. Auto Adjust

(RGB only.) Use Auto Adjust when the RGB source is active to force the display to evaluate the RGB signals and ensure that it is interpreting them correctly. To perform an Auto Adjust within the OSD, select the option and press **ENTER**. (From the remote, close the OSD and press the **AUTO** button.) The screen will go black briefly while the signals adjust.

7.3.8.5. RGB Phase

(RGB only.) Use RGB Phase to adjust the default phase value used for RGB signals. Each RGB video source can have different phase values, which can result in the RGB video image appearing to jitter. RGB Phase enables you to adjust the RGB video image without any jitter.

From the Technician Menu, press the ▼ button to choose **RGB Phase** and then press **ENTER** to open the control bar, as shown below.

Press the ► button to increase the RGB phase value until the jittering stops.

Press **EXIT** to set the phase value and close the control bar.

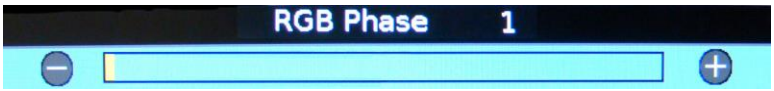


Figure 25 RGB Phase control bar

7.4. Info

Use the Information page to review operating status of the monitor. To access the Technician Menu, highlight the Back option. For more information about the Technician Menu see Section 8 beginning on page 21.

To open the page, press the **INFO** button on the remote, or use the ◄►▲▼ buttons from within the OSD menu.

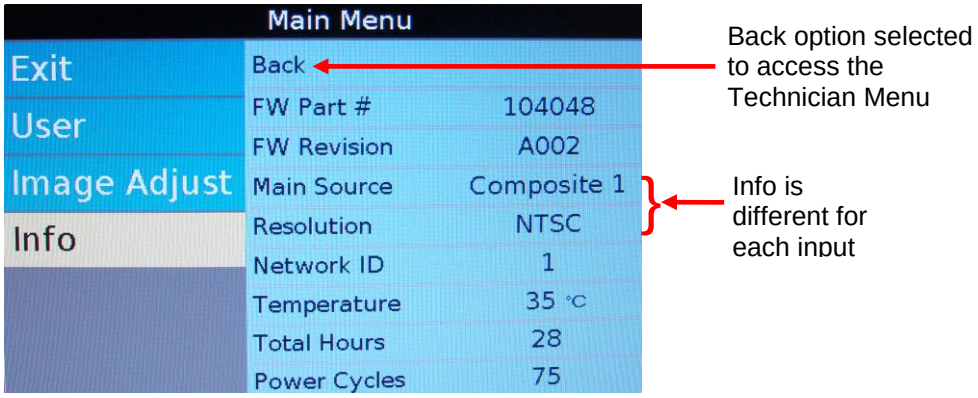


Figure 26 Info page

8. TECHNICIAN MENU

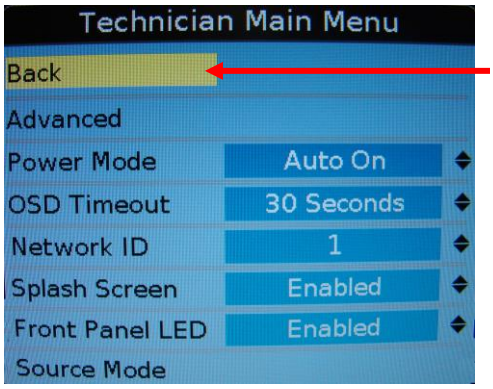
To protect the display from accidental or unintentional adjustments, the Technician Menu is accessible only with a special button combination. To avoid repeating this button sequence after each change, the menu remains active until you manually close it.

NOTICE To ensure proper operation, perform a power cycle after changing a setting in the Technician Menu.

The Technician Menu options may vary slightly different depending on the current video source.

To open the Technician Menu, start with the display on, and press the following buttons in this order:

1. Press **INFO**.
2. With the **Back** option highlighted on the Main Menu, press the ▲▼▲▼▲▲▲ buttons and then press **MENU**.
3. The Technician Menu opens.



Press **Back** to exit the Technician Menu and return to the Info page

Figure 27 Technician Main Menu

To navigate the menu options, press the ▲ or ▼ buttons.

To close the Technician menu and return to the Info Page, select the **Back** option and press **MENU**. To close the Technician Menu and the OSD, press **EXIT**.

8.1. Advanced Technician Menu

This submenu provides installers and technicians more advanced controls of the image.

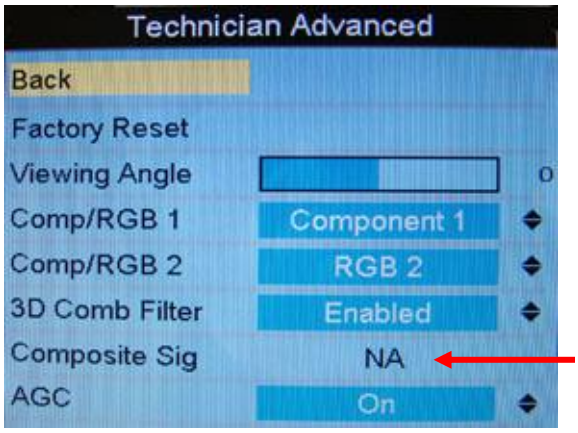


Figure 28 Technician Advanced Menu

8.1.1. Factory Reset

Choose this option to perform a complete factory restore. It is similar to Reset Scheme in the Main Menu→Advanced submenu; however, Factory Reset returns all items with pre-determined defaults in *both* the User and Technician menus to their default settings.

Highlight Advanced→Factory Reset and press ENTER.

A *Reset Complete* message appears after the display restores the default settings.

8.1.2. Viewing Angle

Use Viewing Angle to adjust the settings for viewing angles from different seat positions. Changes to the Viewing Angle adjustment will affect other User→Image Adjust settings.

Highlight Advanced→Viewing Angle and press ENTER.

Press the ◄ or ► to adjust the viewing angle in 5-degree increments from -20 to +20 degrees.

Press **ENTER** to set the viewing angle and close the control bar.

Select **Back** to return to the Technician Menu.

Press **EXIT** to exit the OSD.

Figure 29 Viewing Angle control bar

8.1.3. Comp/RGB 1

Use Comp/RGB 1 to specify which input source the Component/RGB channel 1 will use. The options for channel 1 to display are either Component or RGB.

Highlight Advanced→Comp/RGB 1 and press ENTER.

Use the ▲▼ buttons to set the option and then press **ENTER**.

Select **Back** to return to the Technician Menu.

Press **EXIT** when you are ready to exit the OSD.

8.1.4. Comp/RGB 2

Use Comp/RGB 2 to specify which input source the Component/RGB channel 2 will use. The options for channel 2 to display are either Component or RGB.

Highlight Advanced→Comp/RGB 2 and press ENTER.

Use the ▲▼ buttons to set the option and then press **ENTER**.

Select **Back** to return to the Technician Menu.

Press **EXIT** to exit the OSD.

8.1.5. 3D Comb Filter

(Composite only.) When set to Enabled, the display will eliminate dot crawl and some noise on stationary portions of the picture.

Highlight **Advanced→3D Comb Filter** and press **ENTER**.

Use the ▲▼ buttons to set the option and then press **ENTER**.

Select **Back** to return to the Technician Menu.

Press **EXIT** to exit the OSD.

8.1.6. Composite SIG (Signal)

This is a read-only screen about the signal strength of the currently viewed Composite source. Composite Signal Strength ranges from 0 to 1.25 Vpp in 0.25V increments. It will read NA (not available) if a Composite source is not active or AGC (below) is set to disabled.

8.1.7. AGC (Automatic Gain Control)

This option is a signal compensation tool that will accommodate for strong and weak Composite signals.

Highlight **Advanced→AGC** and press **ENTER**.

Use the ▲▼ buttons to set the option and then press **ENTER**.

Select **Back** to return to the Technician Menu.

Press **EXIT** to exit the OSD.

8.2. Power Mode

Use Power Mode to set the display’s power mode, or on/off setting, to a specific state.

From the Technician Menu, press the ▼ button to select **Power Mode** and then press **ENTER**.

Use the ▲▼ buttons to set the option and then press **ENTER**.

Options include the following:

- **Auto-On:** The display will start up in the ON state when 28V is applied. The display can be turned on or off (standby) from the RS-232, RS-485, or IR.
- **Auto-Off:** The display will start up in the OFF state (standby) when 28V is applied. In Auto-Off power mode, the display can be turned on or off (standby) from the RS-232, RS-485, or IR.
- **Restore Previous:** The display returns to the previous power state after a power interruption. In Restore Previous power mode, the display can be turned on or off (standby) from the RS-232, RS-485, or IR.
- **Ground-On:** The display will turn ON if the power pin #4 is closed (grounded), and it will be turn OFF if the pin is open (not grounded). This setting will not take effect until you close the OSD. In Ground-On mode, the display overrides any commands from the RS-232, RS-485, or IR.
- **Open-On:** The display will turn ON when the power pin #4 is open (not grounded), and it will turn OFF (standby) if the pin #4 is closed (grounded). This setting will not take effect until you close the OSD. In Open-On mode, the display overrides any commands from the IR, RS-232, and RS-485.
- **Momentary:** If the power pin #4 is grounded for more than 150ms, the display will toggle the power state. For example, if the display is ON, it will go to standby mode. If the display is in standby mode, the monitor will turn ON. In Momentary power mode, the display can be turned on or off (standby) from the RS-232, RS-485, or IR.

Select **Back** to return to the Technician Menu.

Press **EXIT** to exit the OSD.

8.3. OSD Timeout

Use OSD Timeout to set the amount of time the menu screens are visible, without making any changes, before they timeout and close automatically.

There are three increments: 6 Seconds, 15 Seconds, and 30 Seconds.

From the Technician Menu, press the ▼ button to select **OSD Timeout** and then press **ENTER**.

Use the ▲▼ buttons to select a time increment and press **ENTER**.

Press **EXIT** to exit the OSD.

8.4. Network ID

Use this option to specify the IR and RS-485 network addresses to control multiple displays from a single cabin management system or remote control.

Each display requires a unique address on the RS-485 network. Setting this address sets the value for both interfaces. Network settings for Rosen displays are scaled from 1 to 31.

From the Technician Menu, press the ▼ button to select the **Network ID**, and then press **ENTER** to open the screen.

Use the ▲▼ buttons to select an address between 1 and 31 for the display and press **ENTER**.

Press **EXIT** to exit the OSD.

8.5. Splash Screen

Use this option to turn a pre-configured splash screen on or off. The splash screen appears for approximately eight seconds when 28V power is first applied to the display.

When enabled, the Rosen Aviation splash screen appears. When disabled, the screen remains black.

Highlight Technician→Splash Screen and press ENTER.

Use the ▲▼ buttons to set the option and then press **ENTER**.

Press **EXIT** to exit the OSD.

8.6. Front Panel LED

The Front Panel LED option turns the IR window LED on or off. When the option is Off, the LED will be black. When it is On, the LED will have the following states:

- **Green** indicates the display is receiving power.
- **Amber** indicates the display is in standby mode.
- **Red** indicates the display is registering an error.
- **Black** indicates the display is receiving no power.

Highlight Technician→Front Panel LED and press ENTER.

Use the ▲▼ buttons to set the option and then press **ENTER**.

Press **EXIT** to exit the OSD.

8.7. Source Mode

This submenu enables you to set the Source Select mode to a specific state: either Momentary Switch Mode or Constant Switch Mode.

Highlight Technician→Source Mode and press ENTER.

Use the ▲▼ buttons to set the option and then press **ENTER**.

Note: To ensure proper operation, perform a power cycle after changing a setting.

8.7.1. Momentary Switch Mode

Momentary enables you to specify those sources that will be On or Off and cycle between only the enabled video sources. If the select switch pin #2 (SELECT_SW_IN) is grounded for more than 150ms, the display will toggle to the next enabled source. This mode also contains an option to specify an Auto Detect source.

If the source specified in the Auto-Detect option is connected, the display will ignore all source commands. When that source is removed, the monitor will return to normal momentary operation.

Note: When auto-detecting a source, sources 1 & 2 are no longer selectable during normal momentary operation.

Note: Be sure to set **Auto Detect** to **None Selected** before switching from Momentary to Constant; otherwise, the image may flash off and on.

Highlight Technician→Source Mode→Momentary and press ENTER.

Use the ▼ to select **Auto Detect** and press **ENTER**.

Select which video input will be in an auto-detected state and press **ENTER**.

Use the arrow buttons to turn the other video inputs On/Off and press **ENTER**.

Select **Back** to return to the Technician Menu

Press **EXIT** to exit the OSD.

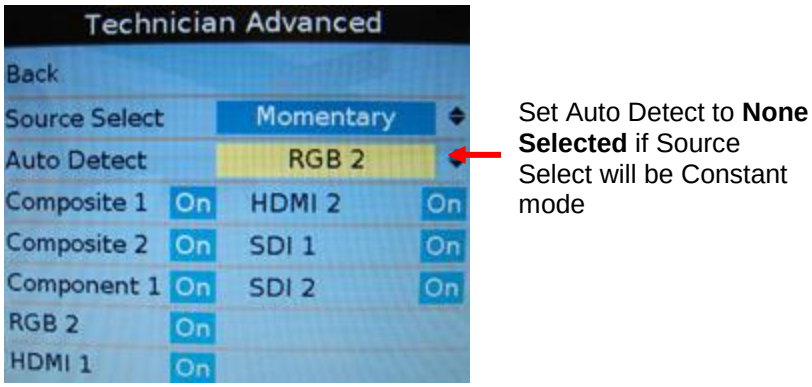


Figure 30 Momentary Switch Mode settings

8.7.2. Constant Switch Mode

Constant enables you to specify the two sources the display will switch between when the Source Select switch pin #2 (SELECT_SW_IN) goes between the Open state and Ground state.

Highlight Technician→Source Mode→Source Select and press ENTER.

Select **Constant** and press **ENTER**. Press ▼ to select **Open** and press **ENTER**.

Select which video input will be in an open state and press **ENTER**.

Press ▼to select **Ground** and press **ENTER.**

Select which video input will be to a ground state and press **ENTER**.

Select **Back** to return to the Technician Menu, or press **EXIT** to exit the OSD.

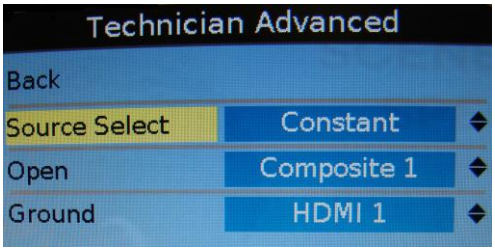


Figure 31 Source Select Constant options

9. TECHNICAL REFERENCES AND SUPPORT

NOTICE

Always check www.rosenaviation.com under the Products tab to ensure that you are working with the most current revision of technical documentation.

Table 3 Technical references

Product	Part Number	Location
Universal Color Remote Control	Contact Rosen Sales for part number availability	
RS-232 7-button External Controller	0300-408	www.rosenaviation.com

If you need assistance in configuring a universal remote control to work with a 19” High-definition display, please contact Rosen Aviation Technical Support at 541.342.3802.

9.1. Troubleshooting

If the display does not function properly, refer to the following troubleshooting table for symptoms and possible solutions before contacting Rosen field support.

Note: Use an oscilloscope or another display to verify the video signal. Always use a multimeter to verify voltages. Check actual results against the requirements described in this manual.

Problem	Possible Solutions
No video (signal)	• Verify that the video is turned and the video is on. • Verify that you are in the correct source mode. • Verify that a signal is reaching the display using an oscilloscope or another display. • Check Power Mode settings on page 24. • Verify that the pinout is correct.
Screen is black	• Verify that the display is receiving power. • Check Power Mode settings on page 24. • Verify that the pinout is correct. • Verify that the video source is on and DVD installed. • Verify all connections between the source and the display.
Image flashes on/off	Perform a Factory Reset from the Technician Menu, on page 22, to clear the Auto Detect. See also Momentary Switch Mode on page 26.
Image flickers	• Verify that the signal cable is secure. • Verify that the vertical frame frequency is 75 HZ or less.
Distorted Image	• Verify supported resolution. See Specifications on page 31. • Verify pinouts. • Verify that a signal is reaching the display using an oscilloscope or another display. • Examine the display for pinched or damaged cables.
Wrong Colors	• If the screen colors are not what you expect, reset the current scheme. For more information, see Reset Scheme on page 16 and Restore Defaults on page 18.

9.2. Cleaning the Display

To clean the LCD, very gently wipe the screen with a clean, commercially approved LCD cleaning cloth and alcohol-free LCD cleaning solution. Use one firm cleaning motion instead of circular or repeated side-to-side scrubbing.

9.3. RTCA DO-160F Qualifications

The table below summarizes the basis for qualification of the 1900-001 and 1900-003 displays by similarity to Rosen’s previously qualified 19” HD WS display (P/N 1900-002H), unless otherwise noted.

Table 4 DO-160 Level F Test Criteria for the 1900-001 and 1900-003 displays

Description	Section	Category	Comments
Temperature and Altitude	**4**		
Ground Survival/Short-Time Operating Low Temp	4.5.1	A1	Tested
Operating Low Temperature	4.5.2	B4	Tested to 0°C
Ground Survival/Short-Time Operating High Temp	4.5.3	A1	Tested
Operating High Temperature	4.5.4	A1	Tested
In-flight Loss of Cooling	4.5.5	–	Not applicable
Altitude	4.6.1	B4	Qual by similarity to 1900-002H; tested to 25K ft
Decompression	4.6.2	A1	Qual by similarity to 1900-002H; tested 6K–51K ft
Overpressure	4.6.3	A1	Qual by similarity to 1900-002H
Temperature Variation	**5**		
Temperature Variation	5.3.1	C	Tested
Humidity	**6**		
Humidity	6.3.1	A	
Operational Shocks & Crash Safety	**7**		
Operational Shocks	7.2.1	B	
Crash Safety (Impulse)	7.3.2	B	
Crash Safety (Sustained)	7.3.3	B	Qual by similarity to 1900-002H; tested to 9.1g/axis
Vibration	**8**		
Random Vibration – Fixed Wing Aircraft	8.5.2	S (Curve C)	
Magnetic Effect	**15**		
Magnetic Effect	15.3	Z	Tested
Power Input	**16**		
Normal Operating Conditions (DC)	**16.6.1**		
Average Value Voltage (DC)	16.6.1.1	Z	
Ripple Voltage (DC)	16.6.1.2	Z	

Description	Section	Category	Comments
Momentary Power Interruptions (DC)	16.6.1.3	Z (A)	Qual by similarity to 1900-002H; operation through interrupts up to 200ms, unit self recovery over 200ms
Normal Surge Voltage (DC)	16.6.1.4	Z	
Engine Starting Under Voltage Operation (DC)	16.6.1.5	Z	
Abnormal Operating Conditions	**16.6.2**		
Voltage Steady State (DC)	16.6.2.1	Z	
Momentary Under Voltage (DC)	16.6.2.3	Z	
Abnormal Surge Voltage (DC)	16.6.2.4	Z	
Voltage Spike	**17**		
Voltage Spike	17.4	A	Tested
Audio Frequency Conducted Susceptibility	**18**		
AF Conducted Susceptibility- Power Inputs	18.3.1	Z	
Induced Signal Susceptibility	**19**		
Magnetic Fields Induced Into Equipment	19.3.1	AC	
Magnetic Fields Induced Into Interconnecting Cables	19.3.2	AC	
Electric Fields Induced Into Interconnecting Cables	19.3.3	AC	
Spikes Induced Into Interconnecting Cables	19.3.4	AC	
Radio Frequency Susceptibility	**20**		
Conducted Susceptibility (CS) – 10kHz to 400MHz	20.4	T	
Radiated Susceptibility (RS) – 100MHz to 18GHz	20.5	T	
Emission of Radio Frequency Energy	**21**		
Conducted RF Emission	21.4	M	1900-003 passed Cat M; 1900-001 passed Cat B & Cat M
Radiated RF Emission	21.5	M	1900-003 passed Cat M; 1900-001 passed Cat B
Electrostatic Discharge (ESD)	**25**		
Electrostatic Discharge (ESD)	25.5	A	Tested
Flammability	**26**	N/A	Flammability testing in acceptance with 14 CFR 25.853 Appendix F

9.4. Other Certification Considerations

Description	Comments
Static Abuse Load (300 lbs.)	Testing in accordance with DO 313 section 4.2(a), Glass in the Cabin
Mechanical Strength (Ball Impact)	Testing in accordance with UL 61965
Inertia Loads	Testing in accordance with 14 CFR 25.561(b) (3)

9.5. Specifications

Table 5 Model 1900 series displays performance specifications

Screen size	19” diagonal, 16x10 format
Native Resolution	1440 x 900
Video inputs	480i/576i through 1080p, VGA-WUXGA
Viewing Angles*: Horizontal and Vertical	±80º
Screen Brightness	300 cd/m^2 typical
Contrast Ratio	1000:1
Color Depth	8 bits
Weight	1900-001 – 8.9 lbs [4.037 kgs.] ± 10% 1900-003 – 9.1 lbs [4.13 kgs.] ± 10%
Nominal Voltage/Current Draw	28VDC/55mA
Operating Temperature	-15ºC – 55ºC

*The intended viewing position is electronically adjustable within this range.

9.5.1. Supported DVI/HDMI Graphic Resolutions

640x480/60 VGA
800x600/60 SVGA
1024x768/60 XGA
1152x864/60
1280x768/60 WXGA
1360x768/60 WXGA
1440x900/60 WSXGA
1280x1024/60 SXGA
1400x1050/60 SXGA+
1680x1050/60 WSXGA+
1600x1200/60 UXGA
1920x1200/60 (154MHz) WUXGA reduced-blanking

9.5.2. Supported DVI/HDMI Standard Resolutions

480i29, 480i30
480p59, 480p60
576i25
576p50
720p50, 720p59, 720p60
1080i25, 1080i29, 1080i30
1080p23, 1080p24, 1080p25, 1080p50, 1080p60

9.5.3. Supported VGA Resolutions

640x480/60 VGA
800x600/60 SVGA
1024x768/60 XGA
1152x864/60
1280x768/60 (68.250MHz) WXGA
1280x768/60 (79.500MHz) WXGA
1360x768/60 WXGA
1440x900/60 WSXGA
1280x1024/60 SXGA
1400x1050/60 (101.000MHz) SXGA+
1400x1050/60 (121.750MHz) SXGA+
1680x1050/60 WSXGA+
1600x1200/60 UXGA
1920x1200/60 (154MHz) WUXGA reduced-blanking

9.5.4. Supported YPbPr/Component Resolutions

480i29, 480i30
480p59, 480p60
576i25
576p50
720p50, 720p59, 720p60
1080i25, 1080i29, 1080i30

9.5.5. Supported CVBS/Composite Resolutions

NTSC (480i29)
PAL (576i25)
SECAM (576i25)
RS-170 B&W (480i29)

9.5.6. Supported SDI Resolutions

480i29
576i25
720p50, 720p59, 720p60
1080i25, 1080i29, 1080i30
1080p23, 1080p24, 1080p25, 1080p29, 1080p30, 1080p50, 1080p59, 1080p60

10. DEFINITIONS

CVBS	Composite Video Baseband Signal
DCV	Direct Current Volts – voltage from an aircraft battery or generator
DVI	Digital Visual Interface
HD	High Definition
HDMI	High Definition Multimedia Interface
HD-SDI	High Definition Serial Digital Interface
IR	Infrared
LCD	Liquid Crystal Display
LED	Light Emitting Diode
NTSC	National Television Standards Committee. A video standard used in the United States, Canada, Japan, Mexico, the Philippines, South Korea, Taiwan, and some other countries.
OSD	On Screen Display – the actual user/technician menu, and any informational readouts displayed on the image.
PAL	Phase Alternating Line. A video standard used in Europe, China, Malaysia, Australia, New Zealand, the Middle East, parts of Africa, and other parts of the world.
PCB	Printed Circuit Board – an electronics assembly that performs tasks
P/N	Part Number
RGB	Red, Green, Blue
RS-232	Standard for serial binary data interchange
RS-485	Standard for allowing multiple devices to share a common set of serial data communication lines.
SDI	Serial Digital Interface
VGA	Video Graphics Array
Vpp	Volts peak-to-peak
W	Watts

WS Widescreen

WUXGA Widescreen Ultra eXtended Graphics Array

YPbPr Analog video signal carried by component video cable in consumer electronics. Y carries luma (brightness) information. Pb carries the difference between blue and luma (B − Y). Pr carries the difference between red and luma (R − Y).

11. REVISION HISTORY

NOTICE Revision E is limited to draft or prototype documents. Revisions I, O, Q, S, X and Z are not to be used

Revision	Date	Revision Description	EC
A	10/20/10	Initial release	10517
B	05/21/12	Add -003 model, IR receiver, video specifications, DO-313; update Power Mode, Source Select, & misc. OSD changes to match spec; edit control inputs; DO-160 reformatted table and added Cat M	12-0261
C	03/11/14	Update Section 3.2 to clarify mounting options and Section 9.2 cleaning the display	14-0073